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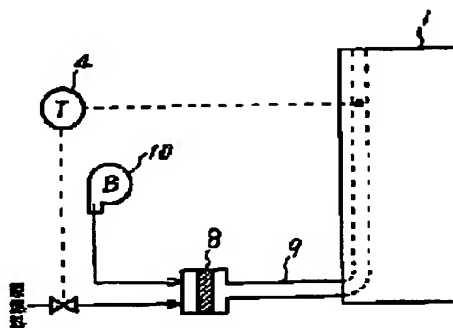
(54) HEAT RETAINING METHOD FOR FUEL CELL

(57) Abstract:

PURPOSE: To retain the heat of a fuel cell without requiring an external power source by burning the starting fuel for plant operation during the stop of a fuel cell power plant to perform the heat retaining operation of equipment having a possibility of freeze.

CONSTITUTION: During the stop of a fuel cell power plant, the material fuel used for plant operation is supplied to a combustor 8 together with the air from a blower 10, and burnt. As this combustor 8, a low temperature catalytic combustor or burner combustor is properly used. The high temperature combustion gas generated here is passed through a piping 9 in a fuel cell body 1 to perform the heat retaining operation of an equipment having a possibility of freeze, for example, a position using phosphoric acid whose freezing temperature is about 50°C.

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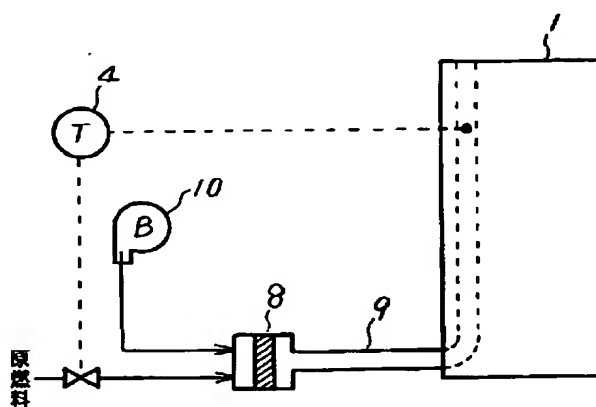
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(54) 【発明の名称】 燃料電池の保温方法

(57) 【要約】

【目的】 本発明の目的は、外部電源を必要とせずに燃料電池を保温することができる燃料電池の保温方法を得ることにある。

【構成】 本発明の燃料電池の保温方法は、燃料電池発電プラントの停止中において、プラント運転に使用する原燃料を燃焼器で燃焼させて、凍結の可能性のある機器の保温操作を行うことを特徴とする。



【特許請求の範囲】

【請求項 1】 燃料電池発電プラントの停止中において、プラント運転に使用する原燃料を燃焼器で燃焼させて、凍結の可能性のある機器の保温操作を行なうことを特徴とする燃料電池の保温方法。

【請求項 2】 前記原燃料を燃焼させる燃焼器として、低温触媒燃焼器を使用することを特徴とする請求項 1 に記載の燃料電池の保温方法。

【請求項 3】 前記燃料を燃焼させる燃焼器として、バーナ燃焼器を使用することを特徴とする請求項 1 に記載の燃料電池の保温方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、燃料電池発電プラントにおける燃料電池の保温方法に関する。

【0002】

【従来の技術】燃料電池発電プラントは、電力用として使用されるとともに、オンサイト用として、消費地に近い場所に設置され、自家発電用とともに、排熱を冷暖房、給湯に利用されている。

【0003】また、燃料電池発電プラントは、発電効率が高いことと、排熱の有効利用ができることが注目されており、又排ガス中の NO_X 、 SO_X 等の低公害性も大きな特徴となっている。

【0004】燃料電池本体に使用されているリン酸は、凍結温度がやく 50°C であるため、プラント停止中は、本体を凍結温度以上に保温する必要がある。この保温方法に、2つの方式がある。1つはプラント停止でも、発電を行なわないだけで、制御装置等が稼働中の場合は、電池冷却水ラインを使用して、凍結の恐れのある機器の保温を行なっている。その他の方法は、外部の電源を使用し、保温用ヒータを設置し機器保温を行なう。

【0005】

【発明が解決しようとする課題】ところが、いずれの保温装置においても、制御装置やヒータに大電力を必要とするとともに、プラント全体を完全に停止することができない制約が生じる。従って、全く外部に電源がない場所には設置できない等の問題点がある。

【0006】従来例として、保温ヒータを使用した装置を図 2 に示す。燃料電池本体 1 に取り付けられた保温ヒータ 2 は、同様に設置された温度計測器 3 の温度指示を入力した温度制御器 4 により制御され凍結温度以上になるように制御される。

【0007】また、プラント運転中に燃料電池本体 1 を冷却する電池装置を使用した保温装置を図 3 に示す。電池冷却水は循環ポンプ 5 により、電池本体 1、電気ヒータ 6 蒸気発生器 7 と循環し、運転中電池本体 1 の発熱を除去している。プラント停止中は温度計測器 3 の指示を入力した温度制御器 4 に制御し、電池冷却水温度を凍結温度以上に保持するようにする。

【0008】このように、従来の技術では、保温用熱源を電気ヒータを使用するため、別設置の外部電源を必要とした。本発明の目的は、外部電源を必要とせずに燃料電池を保温することができる燃料電池の保温方法を得ることにある。

【0009】

【課題を解決するための手段】本発明の燃料電池の保温方法は、燃料電池発電プラントの停止中において、プラント運転に使用する原燃料を燃焼器で燃焼させて、凍結の可能性のある機器の保温操作を行う。また、燃焼器としては低温触媒燃焼器又はバーナ燃焼器を用いる。

【0010】

【作用】これにより、燃料電池発電プラントの停止中においても、凍結の可能性のある機器の保温操作が可能となり、外部電源を必要とせずに燃料電池を保温することができる。

【0011】

【実施例】この発明の実施例を図 1 に示す。燃料電池本体 1 の中に触媒燃焼器 8 より、つながる原燃料を燃焼した温度の高い燃焼ガスを通す配管 9 が通されている。

【0012】温度計測器 3 の指示は、温度制御器 4 により凍結温度以上にあるかどうか判定し、温度低下が生じた場合は、原燃料を触媒燃焼器 8 に注入し、配管 9 内の燃焼ガス温度をあげる。

【0013】燃焼効率をあげ、配管 9 内燃焼ガス置換するために空気ブロワ 10 を使用する。このように、従来の技術では保温用熱源を電気ヒータを使用するため、別設置の外部電源を必要としたが、この発明により、温度制御器 4 と空気ブロワ 10 に消費される小電力により同じ効果が得られる。

【0014】又、温度制御器 4 に機械式、触媒燃焼器 8 に自然換気式の機器を使用すると、全く外部電源を使用しない装置も可能である。燃焼器にバーナ方式燃焼器を使用しても同じ効果が得られる。

【0015】

【発明の効果】燃料電池の設置が期待されている場所に、電気が敷かれていない離島等の遠隔地がある。現在は保温用電源がないため設置が困難であったが、この発明により外部電源がなくても設置が可能となった。

【図面の簡単な説明】

【図 1】本発明の実施例を示す説明図

【図 2】従来例の説明図

【図 3】他の従来例の説明図

【符号の説明】

- 1…燃料電池本体
- 2…保温ヒータ
- 3…温度計測器
- 4…温度制御器
- 5…循環ポンプ
- 6…電気ヒータ

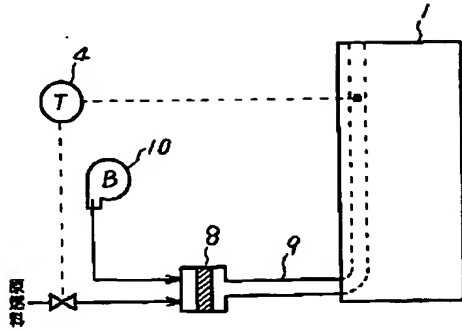
7…蒸気発生器

8…触媒燃焼器

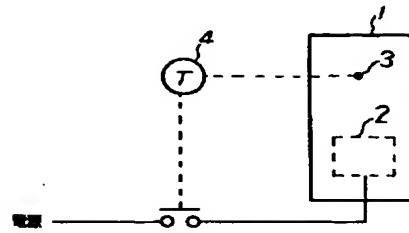
9…配管

10…空気ブロワ

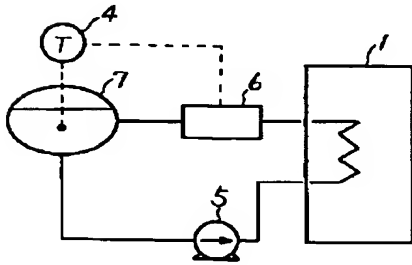
【図 1】



【図 2】



【図 3】



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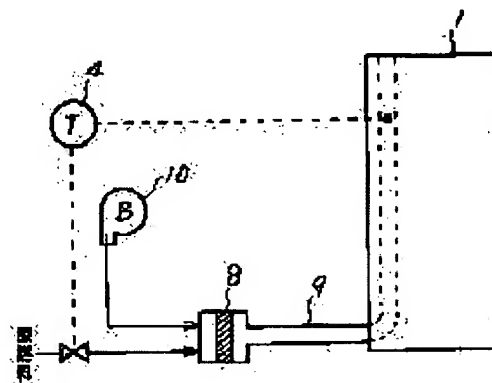
(72)Inventor : YOSHIDA SHUICHI

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CLAIMS

[Claim(s)]

[Claim 1] The keeping-warm method of the fuel cell characterized by performing keeping-warm operation of the device which burns with a combustor the original fuel used for plant operation, and has the possibility of a freeze during a halt of a fuel cell power generating plant.

[Claim 2] The keeping-warm method of the fuel cell according to claim 1 characterized by using low-temperature catalyst **** as a combustor which burns the aforementioned field fuel.

[Claim 3] The keeping-warm method of the fuel cell according to claim 1 characterized by using a burner combustor as a combustor which burns the aforementioned fuel.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the keeping-warm method of the fuel cell in a fuel cell power generating plant.

[0002]

[Description of the Prior Art] While a fuel cell power generating plant is used as an object for power, it is installed in the place near a consumer place as an object for on site, and exhaust heat is used for an air conditioning and hot-water supply with the object for private power generation.

[0003] Moreover, it attracts attention that a generating efficiency is high and that a deployment of exhaust heat can be performed, and the fuel cell power generating plant has been the feature that low-pollution nature, such as NOX in exhaust gas and SOX, is also big.

[0004] Since the phosphoric acid currently used for the fuel cell main part is 50 degrees C which a freezing point burns, it needs to keep a main part warm during a plant halt more than a freezing point. Two methods are in this keeping-warm method. A plant halt also uses a cell cooling water line, and one is keeping the device with fear of a freeze warm for it, when it does not only generate electricity and a control unit etc. is working. An external power supply is used for the other methods, they install the heater for keeping warm, and perform device keeping warm.

[0005]

[Problem(s) to be Solved by the Invention] However, also in which heat retaining device, while needing large power for a control unit or a heater, the restrictions which cannot stop an entire plant completely arise. Therefore, there is a trouble of being unable to install in the place which does not have a power supply outside at all.

[0006] As a conventional example, the equipment which used the keeping-warm heater is shown in drawing 2. The keeping-warm heater 2 attached in the fuel cell main part 1 is controlled to be controlled by the temperature selector 4 which inputted temperature directions of the thermometry machine 3 installed similarly, and to become more than a freezing point.

[0007] Moreover, the heat retaining device which used the cell equipment which cools the fuel cell main part 1 during plant operation is shown in drawing 3. With the circulating pump 5, it circulated through cell cooling water with the main part 1 of a cell, and electric heater 6 steam generator 7, and it has removed generation of heat of the main part 1 of an on-stream cell. During a plant halt, it controls to the temperature selector 4 which inputted directions of the thermometry machine 3, and a cell circulating water temperature is held more than a freezing point.

[0008] Thus, in the Prior art, in order to use an electric heater for the heat source for keeping warm, the external power of another installation was needed. The purpose of this invention is to acquire the keeping-warm method of a fuel cell that a fuel cell can be kept warm, without needing an external power.

[0009]

[Means for Solving the Problem] The keeping-warm method of the fuel cell of this invention burns with a combustor the original fuel used for plant operation during a halt of a fuel cell power generating plant, and performs keeping-warm operation of the possible device of a freeze. Moreover, as a combustor, a low-temperature catalyzed-combustion machine or a burner combustor is used.

[0010]

[Function] Thereby, keeping-warm operation of the device which has the possibility of a freeze during a halt of a fuel cell power generating plant is attained, and a fuel cell can be kept warm, without needing an external power.

[0011]

[Example] The example of this invention is shown in drawing 1. It lets the piping 9 which lets combustion gas with the high temperature which burned the original fuel connected from the catalyzed-combustion machine 8 in the fuel

cell main part 1 pass pass.

[0012] When it judges whether it is with a temperature selector 4 more than a freezing point and a temperature fall arises, directions of the thermometry machine 3 pour original fuel into the catalyzed-combustion machine 8, and raise the temperature of combustion in piping 9.

[0013] In order to gather and carry out piping 9 internal-combustion glow inert gas replacement of the combustion efficiency, the air blower 10 is used. Thus, although the external power of another installation was needed in the Prior art in order to use an electric heater for the heat source for keeping warm, the same effect is acquired by the small power consumed by this invention at a temperature selector 4 and the air blower 10.

[0014] Moreover, if a mechanical cable type is used for a temperature selector 4 and the device of a natural ventilation formula is used for the catalyzed-combustion machine 8, the equipment which does not use an external power at all is also possible. The same effect is acquired even if it uses a burner method combustor for a combustor.

[0015]

[Effect of the Invention] There are remote places, such as a detached island by which the place where installation of a fuel cell is expected is not covered with the electrical and electric equipment. Although installation was difficult since there was no power supply for keeping warm now, installation became possible even if there was no external power by this invention.

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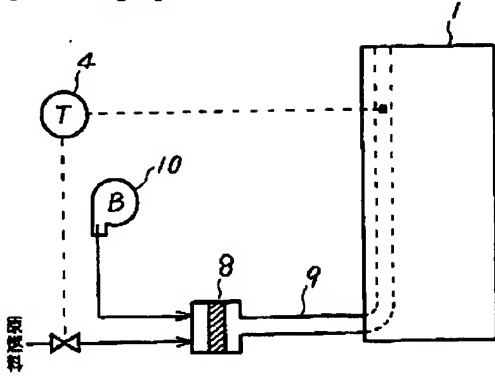
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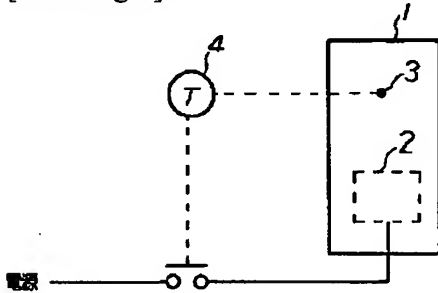
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DRAWINGS

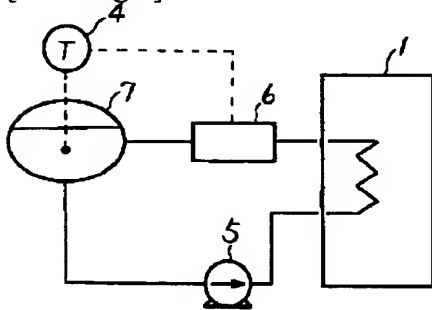
[Drawing 1]



[Drawing 2]



[Drawing 3]



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